# Perception of Tomato Farmers on Effectiveness of Indigenous Postharvest Value Addition Practices in Surulere Area of Oyo State, Nigeria

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***ABSTRACT***

*The study examined the perception of tomato farmers on effectiveness of indigenous postharvest value addition practices in Surulere Area of Oyo State Nigeria. 160 tomato farmers were randomly selected and interviewed through structured interview schedule. Data obtained were subjected to descriptive and inferential statistics. Results revealed that majority of tomato farmers in the study area were; female, married, aged between 41- 45 years and had secondary school education. Harvesting of fully ripe tomato usually packed in basket/ raffia early in the morning were common indigenous handling and packaging practices to prevent post-harvest losses by tomato farmers in the study area. Indigenous preservative methods such as sun drying, pureed and sealed with oil in jars, boiled and sealed, cold water were mostly perceived to be effective indigenous preservative methods by tomato farmers in the study area. Regression analysis further revealed that age of respondent has positive influence on farmers' perception of the effectiveness of indigenous preservative practices. In the view of the findings, it can be concluded that tomato farmers still hold to indigenous postharvest handling, packaging and preservative practices. It is therefore important that agricultural extension services should focus on the provision of facilities that will improve sun drying method commonly used by farmers in the study area.*

**Keywords:** Tomato, post-harvest, indigenous, effectiveness, value addition.

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## INTRODUCTION

Tomato (*Lycopersicon esculentum* Mill) fruit contained nutritional values and it is widely acceptable as food which makes the production highly profitable in Nigeria (Afolami & Ayinde, 2002; Haruna et al 2012; Usman and Bakari, 2013). Unfortunately, tomatoes quality and nutritional values can be affected by post-harvest handling and storage condition (Sablani et al 2006). Babalola *et al*. (2010) have however identified postharvest losses to be one of the problems faced by tomato farmers in the country. FAO, (2004) estimated postharvest losses of fruits and vegetables amounts to 35-45% of the annual production. Postharvest activities include harvesting, handling, storage, processing, packaging, transportation and marketing (Mrema and Rolle, 2002). It includes all points in the value chain from production in the field to the food being placed on the table for consumption.

Due to tomatoes perishable nature and mishandling of tomato during harvesting and post-harvesting, farmers are losing tangible quantity of their produce thus facing a drastic reduction in income generation (FAO 2004). USDA (2010) has attributed such loss to lack of knowledge about improved storage methods, packaging, transporting, processing and marketing of produce. This is because local farmers in the country sill use in indigenous practices in tomato production, storing and packing produce to prevent losses. Muhammad *et al.* (2012) concludes that the farmers lack general knowledge of postharvest handling despite their years of farming experience.

Asiabaka *et al.* (2001) noted that, if farmers do not adopt a new technology, it is because they do not understand well the technology, it is not compatible with existing practice or because they have perceived the technology to be too complicated or too risky and not because they are ignorant. Roger, (2003) further stated that the five important characteristics of innovation related to an individual's perception towards decision-making process and eventual adoption are; relative advantage, compatibility, complexity, observable and trial. Ouma *et al.* (2012) affirmed that the use of improved agricultural technology is the solution to increased growth and agricultural productivity. It is against this background that this study examined indigenous post-harvest practices and attitude of tomato farmers to value addition in Surulere Area of Oyo State Nigeria. Specifically, the study aimed to; (i) describe the socioeconomic characteristic of tomato farmers in the study area, (ii) identify the indigenous methods of handling and packaging employed by tomato farmers, (iii) examine the perception on effectiveness of tomato postharvest preservative and processing value addition practices in the study area.

### Hypothesis of the study

**$H_{01}$**: There is no significant relationship between selected socioeconomic characteristics of respondents and their perception on effectiveness of tomato postharvest value addition practices.

## METHODOLOGY

The study was conducted in Surulere Local Government of Oyo State. Surulere Local Government shared boundary with Ifelodun and Araolu Local Government of Osun Local Government, Asa Local Government in Kwara State. Surulere is located within longitude $4^0$ and latitude $8^0$, the local government lies with the tropical rain forest zone with its characteristics of wet and dry seasons with the average of 250mm. The temperature ranges from $70^0$- $90^0$ F throughout the season. The area is blessed with vast arable land, shifting cultivation is still the main method of farming in Surulere Local government since the rural population comprising mainly of peasants farmers. Farming is the main occupation of the people but few others have diversified into petty trading, carpentry and others. The Local Government is divided into 10 wards namely: Gambari, Bayaoje, Iresaapa, Arolu, Iresaadu, Iregba, Iwofin, Oko, Illajue and Magin.

The study population comprised of all tomato farmers in Surulere Local Government of Oyo State. Two stage random sampling was used in the selection of respondents for the study. The first stage

involved a simple purposive selection of ten (10) villages in the local government namely: Gambari, Bayaoje, Araolu, Iresaapa, Iresaasadu, Illajue, Mayin, Iwofin, Oko and Iregba. The large number of tomato farmers and marketers necessitated the choice of this area in Oyo State. The second stage involved the random selection of sixteen (16) tomato farmers from the list of registered tomato farmers' association from the selected villages. A total number of 160 farmers were used for the study.

Primary and Secondary data was used for the study. Primary data was gotten from the field survey through the administration of well-structured interview schedule. The structured questionnaire was used to solicit information from the respondents on issues that bothers on the set objectives of the study. The secondary data was gathered from related journals and library**.**Perception of effectiveness on indigenous postharvest practices among farmers in the study area were measured on 5 point likert-type scales of; 5= Strongly Agreed (SA), 4= Agreed (A), 3=Undecided (U), 2= Disagree (D), 1= Strongly Disagree (SD). The data collected were analysed using descriptive statistics such as frequency, percentage, mean score, mean ranking to achieve objective 1, 2 and 3. Also, multiple regression model was used to investigate the determinants of respondents' perception of effectiveness of tomato farmers on indigenous postharvest value addition practices. The form of the regression model is given as:

$Y = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7 + b_8X_8 + e_t$

Where: $b_o$ is constant term

$b_1$…….$b_9$ = coefficient of regression

Y = Perception of effectiveness on indigenous postharvest practices (dependent variable)

Xn = Explanatory variables

$X_1$ = Gender

$X_2$ = Age

$X_3$ = Marital Status

$X_4$ = Household size

$X_5$ = Educational level

$X_6$ = Occupation

$X_7$ = Farm experience

$X_8$ = Farm size

$e_t$ = Error term/disturbance term

## RESULTS AND DISCUSSION

### *Socio-economic Characteristics of Respondents*

Analysis of data illustrated in table 1 showed that 62.5% were females while 37.5% of the tomato farmers in the study area were males. The highest number of female respondents suggests that tomato farming in the study area is mostly practiced by females. This finding is not in line with Adepeju, (2014) who reported majority of tomato farmers in Ogbomoso, Oyo state were male.

Result presented in table 1 further show the mean age of respondents to be 43 years. Also, majority (81.6%) were married and 7.6% were widower. As regards educational status of respondents, results revealed that majority (55.6%) had secondary school education. With majority of the tomato farmers in the study area having secondary education implies respondents are literate to some extent to use value addition practices. This is in line with Mrema (2002) who stated the education imparts knowledge, creates awareness and makes inquisitiveness to explore and learn, helps become skilled and make desirable changes in adoption.

Results presented in table 1 further indicated that majority (74.3%) of the respondents have no other occupation aside tomato production with majority (46.8%) cultivating about 2 hectares. About 28.1% who have engaged in tomato farming venture for not less than 11 – 15 year. This finding implies that tomato farming in the study area is profitable.

**Table 1:** Socioeconomic characteristics of respondents

| *Socioeconomic Characteristics* | *Frequency* | *Percentage* |
|---|---|---|
| **Gender:** | | |
| Male | 60 | 37.5 |
| Female | 100 | 62.5 |
| **Age in years:** | | |
| <35 | 8 | 5.0 |
| 36 – 40 | 35 | 21.8 |
| 41 – 45 | 50 | 31.3 |
| 46 – 50 | 24 | 15.0 |
| 51 – 55 | 20 | 12.5 |
| >56 | 23 | 14.4 |
| **Marital status:** | | |
| Married | 131 | 81.8 |
| Divorce | 17 | 10.6 |
| Widow/ widower | 12 | 7.6 |
| **Educational level:** | | |
| No formal education | 3 | 1.8 |
| Adult education | 16 | 10.0 |
| Primary education | 48 | 30.0 |
| Secondary education | 89 | 55.6 |
| Tertiary education | 4 | 2.5 |
| **Occupation** | | |
| Tomato farming | 119 | 74.3 |
| Cassava farming | 20 | 21.5 |
| Trading | 21 | 4.2 |
| **Household size (people)** | | |
| <5 | 24 | 15.0 |
| 6 – 8 | 38 | 24.0 |
| 9 – 11 | 53 | 33.1 |
| 12 – 14 | 20 | 12.5 |
| >15 | 25 | 15.4 |
| **Year of farm experience** | | |
| 1 – 5 | 9 | 5.6 |
| 6 – 10 | 35 | 21.8 |
| 11 – 15 | 45 | 28.1 |
| 16 – 20 | 35 | 21.8 |
| >20 | 36 | 22.5 |
| **Farm size in hectare** | | |
| 1 | 28 | 17.5 |
| 2 | 75 | 46.8 |
| 3 | 50 | 31.3 |
| 4 | 7 | 4.4 |

***Source:*** *Field survey, 2013*

***Indigenous value Addition Practices Employed by Tomato Farmers to prevent postharvest losses***

Analysis of data presented on handling practices in table 2 revealed that majority (58.6%) of the respondents harvest their tomato early in the morning. Only 0.6% harvests their produce in the afternoon while 40.6% harvest their tomato in the evening. This finding does not agree with Ajagbe *et al.* (2014) who reported that majority of tomato farmers in Ogun State, Nigeria preferred to harvest tomatoes in the evening. This implies that majority of the respondents under this study were aware of the postharvest implication of the time of harvest on tomato produce and to ensure tomatoes were

harvested at the coolest possible temperature. Within this favourable temperature period, farmers will be able to get to the market to sell to the consumers on the same day. This way, the rate of tomato spoilage will be reduced.

It was also revealed in table 2 that 30.6% of the respondents harvest their tomato when it is matured green, 51.9% harvest their tomato when fully ripe and 17.5% harvest their tomato when it is half ripe. Indication that majority of the respondents' harvest their tomato when fully ripe is evidence for considerable losses of tomato produce among farmers in the study area. This is contained in a statement by Orzolek *et al.* (2006) that tomatoes (especially for the wholesale market) should usually be picked at the mature green to prevent the fruit from becoming overripe during long transportation/shipping and handling.

Table 2 also revealed that majority (72.5%) of the respondents use basket/ raffia in packaging their produce to the market, 8.8% of the respondents use plastic crates and 18.8% use bucket in packaging their tomato produce to the market. Majority of the respondents using basket to package their tomato produce implies reduce postharvest losses. This practice is in accordance with Kitinoja (2008) who recommends the use of plastic crate or baskets to package tomato produce because of its susceptibility in order to avoid the produce being compressed together and damage.

**Table 2:** Indigenous value addition initiatives of postharvest for handling and packaging

| *Indigenous Methods* | *Frequency* | *Percentage* |
|---|---|---|
| **Time of harvest** | | |
| Early morning | 94 | 58.6 |
| Afternoon | 1 | 0.6 |
| Evening | 65 | 40.6 |
| **Stage of harvesting** | | |
| Matured green | 49 | 30.6 |
| Fully ripe | 83 | 51.9 |
| Half ripe | 28 | 17.5 |
| **Packaging materials** | | |
| Basket/ raffia | 116 | 72.5 |
| Sack with mango leaves | 14 | 8.8 |
| Plastic crates | 30 | 18.8 |
| Bucket | | |

***Source:*** *Field survey, 2013*

***Perception of Tomato Farmers to effectiveness of Value Practices for preservation and processing***

Perception of respondents on effectiveness of indigenous tomato postharvest value addition practices as presented in table 3 revealed effectives in the order of sun dried into chips was ranked first with mean score = 4.8, pureed and sealed with oil in jars, Boiled, sealed and sealed, peeled tomato preserves were ranked second with mean score = 4.3 respectively, cold water bath was ranked fifth with mean score = 4.2, fresh and frozen was ranked sixth with mean score = 3.7, fresh refrigerated was ranked seventh with mean score = 3.5, Ground and frozen was ranked eighth with mean score = 3.4, fresh frozen was ranked ninth with mean score = 3.3, processed into jams and processed into juice was ranked tenth with mean score = 3.2 respectively, picking and sorting initiative was ranked twelfth with mean score = 2.4, keeping fresh produce inside farm structure for cooling and keeping fresh produce under shady tree for cooling initiatives were considered the least effective which ranked thirteenth with mean score = 2.1. For sun dried into chip to be ranked first for its effectiveness, this implies that sun-drying of tomato into chip is the commonly used indigenous initiative to preserve tomato among farmers in the study area.

**Table 3:** Percentage distribution of respondents according to their perception on effectiveness of indigenous tomato postharvest value addition initiatives

| | SD | D | U | A | SA | Mean | Rank |
|---|---|---|---|---|---|---|---|
| Cold water bath | 53.1 | 0.5 | 23.4 | - | 3.2 | 4.2 | 5 |
| Sun dried into chips | 91.8 | 5.0 | - | - | 3.2 | 4.8 | 1 |
| Fresh frozen | 3.8 | 27.0 | 57.9 | | 1.2 | 3.3 | 9 |
| Keep fresh produce inside farm structure for cooling | - | 4.4 | 1.9 | 90.6 | 3.2 | 2.1 | 13 |
| Pureed and sealed with oil in jars | 40.3 | 54.1 | 5.0 | - | 0.6 | 4.3 | 2 |
| Boiled and sealed | 40.3 | 54.1 | 5.0 | - | 0.6 | 4.3 | 2 |
| Keep fresh produce under shady tree for cooling | - | 3.8 | - | 95.6 | 0.6 | 2.1 | 13 |
| Picking and sorting | 1.3 | 2.5 | 9.4 | 86.2 | 0.6 | 2.4 | 12 |
| Ground and frozen | 7.5 | 7.5 | 84.8 | 1.9 | 0.6 | 3.4 | 8 |
| Fresh and frozen | 22.6 | 25.8 | 50.9 | - | 0.6 | 3.7 | 6 |
| Fresh refrigerated | 9.4 | 36.5 | 53.5 | - | 0.6 | 3.5 | 7 |
| Peeled tomato preserves | 38.3 | 59.7 | 1.0 | - | - | 4.3 | 2 |
| Processed into jams | 3.0 | 27.7 | 58.5 | 9.4 | 0.6 | 3.2 | 10 |
| Processed into juice | 3.0 | 27.7 | 58.5 | 9.4 | 0.6 | 3.2 | 10 |

Note: SA= Strongly Agreed, A= Agreed, Undecided, D= Disagree, SD= Strongly Disagree.

***Hypothesis*:** There is no significant relationship between selected socioeconomic characteristics of respondents and their perception to effectiveness of tomato postharvest value addition initiatives.

The result of regression analysis presented in table 4 revealed that gender was negatively influenced tomato farmers' perception of effectiveness of indigenous postharvest value addition practices ($p< 0.000$) at 1% level of significant. Age was positively significant to perception of tomato farmers' effectiveness of indigenous postharvest practices with p-value (0.062) at 10% level of significant. This means that the older the farmers get, the more their levels of perceived effectiveness of tomato indigenous values addition practices. This may be as a result of better experience in tomato farming and preservation. It may also be expected that the elderly will tend to attach more value to indigenous practices due to lesser complexity involved in those practices.

**Table 4**: Regression table

| **Factors** | **Coefficient** | **Std error** | **t - value** | **P -value** | **Conclusion** |
|---|---|---|---|---|---|
| Gender | -2.402217 | 0.5952622 | -4.04 | 0.000*** | Significant |
| Age | 0.0702872 | 0.0373967 | 1.88 | 0.062* | Significant |
| Marital status | -0.0200696 | 0.4591748 | -0.04 | 0.965 | Not significant |
| Household size | 0.02336 | 0.0661113 | 0.35 | 0.724 | Not significant |
| Level of education | 0.4753125 | 0.3488909 | 1.36 | 0.270 | Not Significant |
| Occupation | -0.6411536 | 0.4212996 | -1.52 | 0.10* | Not significant |
| Farm experience | -0.0165169 | 0.0421062 | -0.39 | 0.695 | Not significant |
| Farm size | 0.3645328 | 0.4705778 | 0.77 | 0.440 | Not significant |
| **Constant** | 20.41868 | 3.257076 | 6.74 | 0.000 | |
| **Adjusted $R^2$** = 0.2027 | | | | | |
| P < 0.01 | | | | | |

**Coefficient significant:** (***=1%, ** = 5%, * = 10%).

## CONCLUSION

The study concludes that majority of tomato farmers in Surulere Local government area of Oyo State were; Female, married, aged between 41- 45 years and had secondary school education.

Harvesting of fully ripe tomato usually packed in basket/ raffia early in the morning were common indigenous handling and packaging practices to prevent post-harvest losses by tomato farmers in the study area. Indigenous preservative methods such as sun drying, pureed and sealed with oil in jars, boiled and sealed, cold water were mostly perceived to be effective indigenous preservative methods by tomato farmers in the study area. Regression analysis further revealed that age of respondent has positive influence on farmers' perception of the effectiveness of indigenous preservative practices.

## RECOMMENDATIONS

The following recommendations were made based on findings of this study:

1. Agricultural extension services should focus on the provision of facilities that will improve sun drying method commonly used by farmers in the study area.
2. Tomato farmers are encouraged to come together or join existing cooperative group for easy access of facilities for postharvest practices.

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